

CLAIMS

We claim:

1. A method for fabricating a textured dielectric substrate for an RF circuit comprising the steps of:
 - selecting at least a first and second dielectric board material, each having at least one electrical property distinct from the other;
 - cutting each of said first and second dielectric board materials into a selected size and shape to form a plurality of dielectric pieces;
 - selectively arranging said dielectric pieces on a base plate in a pattern to produce a textured substrate having at least one effective electrical property at a frequency of interest that is different from a bulk electrical property of each individual one of said dielectric board materials at said frequency of interest.
2. The method according to claim 1 further comprising the step of disposing an adhesive layer between said base plate and said dielectric pieces.
3. The method according to claim 2 further comprising the step of curing said adhesive layer.
4. The method according to claim 3 further comprising the step of polishing a surface of said textured substrate to obtain a selected substrate thickness.
5. The method according to claim 4 further comprising the step of disposing on said textured substrate at least one conductive trace to define an RF circuit element.
6. The method according to claim 1 further comprising the step of selecting said pattern and said plurality of dielectric board materials to produce said at least one effective electrical property.

7. The method according to claim 1 further comprising the step of selecting said effective electrical property from the group consisting of permittivity, permeability, and loss tangent.
8. The method according to claim 1 further comprising the step of selecting a process for cutting each of said first and second dielectric board materials and arranging said dielectric pieces on said base plate to minimize any gaps between edges of adjacent ones of said dielectric pieces.
9. The method according to claim 1 further comprising the step of selecting at least one of said size and shape of said dielectric pieces based on an RF frequency of interest.
10. The method according to claim 1 further comprising the step of selecting said pattern based on an RF frequency of interest.
11. The method according to claim 1 further comprising the step of forming said dielectric board materials from a PTFE (PolyTetraFluoroEthylene) composite.
12. The method according to claim 11 further comprising the step of selecting said composite to include a material from the group consisting of glass fiber, woven glass and ceramics.
13. The method according to claim 1 further comprising the step of cutting said dielectric pieces to be electrically small relative to a wavelength of an RF frequency of interest.
14. A method for fabricating a textured dielectric substrate for an RF circuit comprising the steps of:
 - selecting a plurality of dielectric substrate materials, each of said plurality of dielectric substrate materials having a distinct set of electrical properties different from a remainder of said dielectric substrate materials;

selecting a pattern comprised of at least two types of distinct areas having said distinct sets of electrical properties and each distinct area dimensioned much smaller than a wavelength at a frequency of interest;

cutting each of said plurality of dielectric substrate materials into a size and shape consistent with said distinct areas to form dielectric pieces;

selectively arranging said dielectric pieces on a base plate in accordance with said pattern to form said textured dielectric substrate having at least one effective electrical property at a frequency of interest that is different from each of said distinct sets of electrical properties.

15. The method according to claim 14 wherein said arranging step further comprises forming a single layer of said dielectric pieces on base plate in accordance with said pattern.

16. The method according to claim 15 further comprising the step of screen printing at least one RF circuit element on said textured ceramic dielectric substrate.

17. The method according to claim 14 further comprising the step of disposing a layer of adhesive on said base plate prior to said arranging step.

18. The method according to claim 17 further comprising the step of curing said adhesive layer in a heating step.

19. The method according to claim 17 further comprising the step of screen printing at least one RF circuit element on said textured dielectric substrate.

20. The method according to claim 14 further comprising arranging said dielectric pieces using a computer controlled pick and place machine.

21. The method according to claim 14 further comprising the step of screen printing at least one RF circuit element on said textured dielectric substrate.

22. The method according to claim 14 further comprising the step of polishing a surface of said textured ceramic dielectric substrate.

23. The method according to claim 21 further comprising the step of screen printing at least one RF circuit element on said textured ceramic dielectric substrate.

24. A method for fabricating a textured dielectric substrate for an RF circuit comprising the steps of:

forming a plurality of dielectric pieces from at least two different types of dielectric board materials, each having at least one electrical property different from the other, said dielectric pieces dimensioned smaller than a wavelength at a frequency of interest;

selectively arranging said dielectric pieces on a base plate in a pattern to produce a textured substrate having at least one effective electrical property at a frequency of interest that is different from a bulk electrical property of each individual one of said dielectric board materials at said frequency of interest.